

Alternative Measures of Price Change for GNP, 1969-72

THE implicit price deflator for GNP, a byproduct of the calculation of constant-dollar, or "real", GNP, has been used increasingly over the past several years as a comprehensive composite index of the prices of all the goods and services that make up the GNP. Unlike most price indexes, which are constructed with fixed weights, the GNP deflator is based on shifting weights that reflect the shifting composition of GNP. This was explained in an article in the March 1969 SURVEY,¹ which carried a table for the period 1965-68 comparing the quarter-to-quarter behavior of the implicit deflator with that of alternative indexes of GNP prices using fixed weights.

The fixed weighted price indexes published in 1969 were based on 1958 weights and fourth quarter 1966 weights. New fixed weighted indexes based on 1967 weights were published in the August 1971 SURVEY, which carried a table for the period 1965-71 showing quarter-to-quarter percentage changes in the implicit deflator, the fixed weighted index using 1967 weights, and the chain price index. In the chain index calculation, quarter-to-quarter percentage changes are weighted by expenditures in the first of the two quarters involved.

The tables presented here take account of the revisions of 1969-72 income and product data published in July 1972. The data for 1965-68 published in the August 1971 SURVEY have not been revised. The quarter-to-quarter percentage changes in the implicit deflators and chain indexes for total GNP and for gross private product are updated on an ongoing basis in table 19 of the national income and product

tables published every month in the SURVEY.

Table 1 shows quarter-to-quarter percentage changes in the various price measures. Table 2 shows quarterly values of the fixed weighted price indexes calculated with 1967 weights. The indexes are shown on the base 1958=100, the same base used for the implicit deflators.

The fixed weighted index based on 1967 weights and the chain index increased at about the same rate as the implicit deflator for total GNP in the period 1965-70, although there were occasional short-run divergences because of changes in the composition of constant-dollar GNP, which affect the implicit GNP deflator but not the fixed weighted index or the chain index. However, there has been a persistent divergence during the past six quarters: in every quarter from 1971-I through 1972-II, both the fixed weighted index and the chain index increased at a faster rate than the implicit deflator. The quarterly increase in the fixed weighted index averaged 0.9 percentage point greater (at an annual rate) than the increase in the deflator for total GNP over this period; the quarterly increase in the chain index averaged 0.6 percentage point greater than the increase in the deflator. This persistent di-

vergence was due largely to a steady decline in the weight of Federal general government employee compensation in total real GNP, resulting from a declining level of Federal employment, particularly in the military. Because the level of the deflator for Federal general government employee compensation is high relative to the average deflator for total GNP, a decrease in the weight of this item tends to hold down the level of the implicit deflator for GNP, which has the effect of holding down the rate of increase in the implicit deflator.

The declining weight of Federal general government employee compensation was not the only factor in the divergence observed during the past six quarters. A similar, though less sharp, pattern of divergence can be seen in the measures of price change for gross private product (GNP less output of general government, represented by compensation of general government employees). In this case, the fixed weighted index increased faster than the implicit deflator in each of the six quarters, with the excess averaging 0.6 percentage point (at an annual rate), and the chain index increased faster than the deflator in each of the quarters, with the excess averaging 0.4 percentage point. This divergence resulted from a decline in weights of components of gross private product that have relatively high deflators. Declining weights for output of highways and streets and nonresidential buildings purchased by State and local governments and for output of private industrial buildings have had the largest effects on the private GNP deflator over this period. The weights (i.e., shares of constant-dollar GNP) of these items and of Federal general employee compensation are shown here for the year 1967, the fourth quarter of 1970, and the second quarter of 1972.

(In percent)

| | 1967 | 1970 -IV | 1972 -II |
|---|------|-------------|-------------|
| Federal general employee compensation—military..... | 1.08 | 1.67 | 1.24 |
| Federal general employee compensation—civilian..... | 1.87 | 1.63 | 1.50 |
| State and local government expenditures for construction of highways and streets..... | 1.03 | .90 | .78 |
| State and local government expenditures for construction of nonresidential buildings..... | .99 | .75 | .68 |
| Private expenditures for construction of industrial buildings..... | .75 | .51 | .30 |

1. "Alternative Measures of Price Change for GNP" by Allen H. Young and Claudia Herkles, SURVEY OF CURRENT BUSINESS, March 1969. Reprints are available on request.

Table 1.—Price Changes as Measured by Implicit Deflators, Fixed Weighted Price Indexes, and Chain Indexes, Quarterly, 1969-I—1972-II

(Percent change at annual rate)

| | 1969 | | | | | | | | | | | |
|---|----------------------|-----------------|-------|----------------------|-----------------|-------|----------------------|-----------------|-------|----------------------|-----------------|-------|
| | I | | | II | | | III | | | IV | | |
| | Implicit deflator | 1967 weights | Chain | Implicit deflator | 1967 weights | Chain | Implicit deflator | 1967 weights | Chain | Implicit deflator | 1967 weights | Chain |
| Gross national product..... | 4.22 | 4.55 | 4.50 | 5.45 | 4.59 | 4.59 | 5.13 | 5.71 | 5.57 | 5.46 | 5.43 | 5.34 |
| Personal consumption expenditures..... | 3.68 | 4.81 | 4.08 | 5.14 | 4.98 | 4.35 | 5.49 | 5.43 | 5.39 | 5.08 | 5.59 | 4.23 |
| Durable goods..... | 1.55 | 1.67 | 1.47 | 2.22 | 2.27 | 2.34 | 3.04 | 3.20 | 3.09 | 1.80 | 1.77 | 1.87 |
| Nondurable goods..... | 2.20 | 3.53 | 3.51 | 4.49 | 5.51 | 5.47 | 5.28 | 5.55 | 5.45 | 5.56 | 5.75 | 5.64 |
| Services..... | 5.45 | 5.01 | 5.61 | 4.17 | 5.00 | 4.96 | 5.95 | 6.10 | 5.21 | 5.75 | 5.98 | 5.07 |
| Gross private domestic investment..... | 5.54 | 5.60 | 5.82 | 4.97 | 4.77 | 4.73 | 5.93 | 6.10 | 5.99 | 4.54 | 5.59 | 5.47 |
| Fixed investment..... | 4.59 | 5.16 | 5.04 | 5.29 | 5.03 | 5.02 | 5.91 | 5.40 | 5.24 | 6.11 | 5.57 | 5.51 |
| Nonresidential..... | 12.58 | 11.76 | 11.40 | 7.57 | 8.60 | 0.01 | 8.08 | 7.10 | 7.04 | 9.30 | 9.08 | 9.57 |
| Structures..... | 1.53 | 1.84 | 1.85 | 3.74 | 4.22 | 4.22 | 3.94 | 4.50 | 4.30 | 3.85 | 3.88 | 3.29 |
| Producers' durable equipment..... | 5.04 | 5.13 | 5.13 | 4.07 | 3.82 | 3.91 | 7.04 | 8.18 | 8.17 | 5.65 | 5.53 | 5.34 |
| Residential structures..... | | | | | | | | | | | | |
| Change in business inventories..... | | | | | | | | | | | | |
| Net exports of goods and services..... | 2.29 | 3.19 | 3.10 | 1.57 | .42 | .45 | 7.54 | 7.78 | 7.78 | 10.04 | 9.82 | 9.82 |
| Exports..... | 2.91 | 2.22 | 2.15 | 2.09 | 3.07 | 3.07 | 0.00 | 5.59 | 5.58 | 11.72 | 11.57 | 11.58 |
| Imports..... | | | | | | | | | | | | |
| Government purchases of goods and services..... | 5.12 | 4.65 | 4.58 | 7.05 | 5.59 | 5.64 | 10.44 | 9.97 | 9.75 | 5.95 | 5.87 | 5.80 |
| Federal..... | 5.10 | 2.02 | 2.52 | 6.85 | 4.23 | 4.35 | 15.44 | 15.04 | 15.14 | 5.04 | 4.72 | 4.64 |
| State and local..... | 5.10 | 5.79 | 5.77 | 6.01 | 5.77 | 6.44 | 4.70 | 5.16 | 5.13 | 6.39 | 7.65 | 6.82 |
| Adendum: Gross private product..... | 4.52 | 4.53 | 4.45 | 5.54 | 4.92 | 4.80 | 4.99 | 5.59 | 5.59 | 5.32 | 5.40 | 5.29 |

Table 1.—Price Changes as Measured by Implicit Deflators, Fixed Weighted Price Indexes, and Chain Indexes, Quarterly, 1969-I—1972-II—Continued

(Percent change at annual rate)

| | 1970 | | | | | | | | | | | |
|---|----------------------|-----------------|-------|----------------------|-----------------|-------|----------------------|-----------------|-------|----------------------|-----------------|-------|
| | I | | | II | | | III | | | IV | | |
| | Implicit deflator | 1967 weights | Chain | Implicit deflator | 1967 weights | Chain | Implicit deflator | 1967 weights | Chain | Implicit deflator | 1967 weights | Chain |
| Gross national product..... | 6.65 | 5.89 | 5.53 | 4.30 | 5.13 | 5.59 | 4.64 | 3.68 | 3.54 | 5.45 | 5.61 | 5.62 |
| Personal consumption expenditures..... | 4.32 | 4.88 | 4.75 | 3.55 | 4.44 | 4.34 | 3.48 | 3.46 | 3.39 | 5.42 | 4.79 | 4.65 |
| Durable goods..... | 2.44 | 1.87 | 1.85 | 1.83 | 2.53 | 2.44 | 3.38 | 2.77 | 2.75 | 7.24 | 6.92 | 6.51 |
| Nondurable goods..... | 4.91 | 5.29 | 5.18 | 4.07 | 3.95 | 4.02 | 2.68 | 2.80 | 2.79 | 3.31 | 3.94 | 3.58 |
| Services..... | 5.27 | 5.43 | 5.38 | 4.73 | 4.90 | 4.88 | 4.14 | 4.20 | 4.23 | 5.24 | 5.37 | 5.55 |
| Gross private domestic investment..... | 4.28 | 3.54 | 3.35 | 4.30 | 5.04 | 4.92 | 1.71 | 3.80 | 2.07 | 11.20 | 9.51 | 9.47 |
| Fixed investment..... | 5.74 | 4.74 | 4.87 | 4.53 | 5.43 | 5.11 | 4.28 | 5.43 | 5.35 | 18.75 | 8.40 | 8.24 |
| Nonresidential..... | 5.53 | 5.55 | 5.05 | 5.50 | 11.20 | 10.90 | 7.89 | 7.78 | 7.92 | 12.05 | 14.45 | 13.79 |
| Structures..... | 5.30 | 4.34 | 4.22 | 3.58 | 3.56 | 4.43 | 4.13 | 4.05 | 4.05 | 6.58 | 8.47 | 8.54 |
| Producers' durable equipment..... | -1.63 | -1.51 | -1.81 | 1.25 | 1.17 | 1.13 | -5.55 | -6.53 | -5.92 | 10.16 | 10.24 | 10.25 |
| Residential structures..... | | | | | | | | | | | | |
| Change in business inventories..... | | | | | | | | | | | | |
| Net exports of goods and services..... | 2.47 | 2.54 | 2.55 | 5.25 | 6.79 | 6.72 | 4.29 | 4.23 | 4.23 | -1.55 | -1.59 | -1.65 |
| Exports..... | 5.23 | 5.32 | 5.51 | 5.50 | 6.69 | 6.70 | 11.05 | 11.08 | 11.00 | -1.33 | -1.07 | -1.04 |
| Imports..... | | | | | | | | | | | | |
| Government purchases of goods and services..... | 10.13 | 11.41 | 11.35 | 10.15 | 7.81 | 7.54 | 8.73 | 8.95 | 8.94 | 5.41 | 5.95 | 5.85 |
| Federal..... | 17.45 | 14.25 | 14.64 | 11.14 | 6.55 | 6.59 | 7.05 | 4.57 | 4.62 | 4.30 | 4.77 | 4.62 |
| State and local..... | 5.04 | 5.61 | 5.62 | 5.04 | 5.59 | 5.34 | 5.90 | 5.29 | 5.23 | 7.67 | 7.58 | 7.55 |
| Adendum: Gross private product..... | 5.28 | 4.67 | 4.55 | 3.72 | 4.59 | 4.55 | 3.52 | 3.33 | 3.18 | 5.32 | 5.45 | 5.35 |

Table 1.—Price Changes as Measured by Implicit Deflators, Fixed Weighted Price Indexes, and Chain Indexes, Quarterly, 1969-I—1972-II—Continued
(Percent change at annual rate)

| | 1971 | | | | | | | | | | | |
|---|-------------------|--------------|-------|-------------------|--------------|-------|-------------------|--------------|-------|-------------------|--------------|-------|
| | I | | | II | | | III | | | IV | | |
| | Implicit deflator | 1967 weights | Chain | Implicit deflator | 1967 weights | Chain | Implicit deflator | 1967 weights | Chain | Implicit deflator | 1967 weights | Chain |
| Gross national product..... | 5.89 | 7.04 | 5.84 | 4.35 | 4.73 | 4.63 | 2.85 | 4.53 | 4.44 | 1.59 | 2.80 | 2.11 |
| Personal consumption expenditures..... | 3.94 | 5.34 | 5.19 | 3.65 | 3.58 | 3.60 | 2.67 | 3.35 | 3.35 | 1.15 | 1.51 | 1.30 |
| Durable goods..... | 5.28 | 7.00 | 6.07 | 2.79 | 1.01 | 1.79 | -1.00 | -1.77 | -1.51 | -4.07 | -3.71 | -3.56 |
| Nondurable goods..... | 2.80 | 2.85 | 2.70 | 3.44 | 3.70 | 3.59 | 3.13 | 3.22 | 3.24 | 2.64 | 2.48 | 2.47 |
| Services..... | 7.43 | 7.75 | 7.58 | 4.16 | 4.03 | 4.00 | 4.03 | 5.25 | 5.27 | 2.16 | 2.29 | 2.39 |
| Gross private domestic investment..... | 6.61 | 5.36 | 6.53 | 7.22 | 7.37 | 7.55 | 5.20 | 5.81 | 5.74 | -1.13 | 1.23 | .37 |
| Fixed investment..... | 4.86 | 5.16 | 6.30 | 6.27 | 7.08 | 7.25 | 4.84 | 6.06 | 6.00 | -1.47 | 1.84 | .86 |
| Nonresidential..... | 6.40 | 6.20 | 5.85 | 13.04 | 12.55 | 12.02 | 14.27 | 13.00 | 13.85 | 7.01 | 8.34 | 7.52 |
| Producers' durable equipment..... | 4.30 | 6.13 | 6.08 | 3.60 | 3.97 | 3.98 | 1.15 | 2.04 | 1.70 | -2.88 | -1.03 | -2.78 |
| Residential structures..... | 5.12 | 5.01 | 6.01 | 8.37 | 8.33 | 8.37 | 5.03 | 5.07 | 5.00 | -1.82 | -1.86 | -1.85 |
| Change in business inventories..... | | | | | | | | | | | | |
| Net exports of goods and services..... | 12.54 | 13.70 | 12.72 | 2.15 | 2.60 | 2.60 | .21 | -1.30 | -1.33 | 1.19 | 2.73 | 2.22 |
| Exports..... | 6.24 | 8.59 | 8.57 | 3.36 | 3.09 | 3.57 | 5.36 | 5.31 | 6.20 | 1.92 | 1.44 | 1.42 |
| Imports..... | | | | | | | | | | | | |
| Government purchases of goods and services..... | 12.04 | 11.62 | 11.34 | 5.78 | 6.42 | 6.45 | 1.32 | 4.39 | 3.94 | 2.32 | 3.54 | 5.12 |
| Federal..... | 19.77 | 17.03 | 18.11 | 3.40 | 4.20 | 4.31 | -1.00 | 3.81 | 4.11 | 2.69 | 7.40 | 7.68 |
| State and local..... | 6.90 | 6.44 | 6.90 | 7.38 | 8.71 | 2.05 | 3.00 | 4.05 | 3.62 | 2.04 | 3.70 | 3.90 |
| Addendum: Gross private product..... | 4.78 | 5.53 | 5.49 | 4.29 | 4.56 | 4.44 | 2.78 | 3.53 | 3.44 | 1.03 | 1.07 | 1.42 |

| | 1972 | | | | | |
|---|-------------------|--------------|-------|-------------------|--------------|-------|
| | I | | | II | | |
| | Implicit deflator | 1967 weights | Chain | Implicit deflator | 1967 weights | Chain |
| Gross national product..... | 5.14 | 5.11 | 5.05 | 1.64 | 1.62 | 2.74 |
| Personal consumption expenditures..... | 2.35 | 3.61 | 3.52 | 2.25 | 2.43 | 2.48 |
| Durable goods..... | 4.98 | 5.42 | 4.26 | 1.41 | 1.09 | .80 |
| Nondurable goods..... | 3.29 | 4.03 | 3.79 | 2.38 | 2.56 | 2.49 |
| Services..... | 2.43 | 2.61 | 2.64 | 2.52 | 2.99 | 2.90 |
| Gross private domestic investment..... | 5.73 | 6.39 | 6.56 | 4.47 | 5.14 | 4.04 |
| Fixed investment..... | 5.04 | 7.00 | 8.01 | 5.77 | 4.81 | 4.85 |
| Nonresidential..... | 10.64 | 18.20 | 11.11 | 7.06 | 7.79 | 7.14 |
| Producers' durable equipment..... | 6.02 | 6.87 | 6.94 | 2.91 | 3.02 | 2.32 |
| Residential structures..... | 0.82 | 0.81 | 0.80 | 0.27 | 0.26 | 0.20 |
| Change in business inventories..... | | | | | | |
| Net exports of goods and services..... | 3.83 | 2.51 | 2.51 | 5.45 | 6.67 | 5.67 |
| Exports..... | 6.45 | 7.22 | 7.22 | 12.71 | 12.02 | 12.02 |
| Imports..... | | | | | | |
| Government purchases of goods and services..... | 11.34 | 12.70 | 11.98 | 2.68 | 4.29 | 4.45 |
| Federal..... | 17.48 | 18.93 | 17.00 | 4.13 | 6.03 | 5.98 |
| State and local..... | 7.10 | 7.55 | 6.99 | 1.56 | 2.52 | 2.85 |
| Addendum: Gross private product..... | 4.21 | 4.63 | 4.43 | 3.74 | 2.44 | 2.25 |

Table 2.—Fixed Weighted Price Indexes, 1967 Weights, 1969-I—1972-II
(1968=100)

| | 1969 | | | | 1970 | | | | 1971 | | | | 1972 | |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | I | II | III | IV | I | II | III | IV | I | II | III | IV | I | II |
| Gross national product..... | 155,997 | 127,532 | 129,696 | 131,322 | 111,245 | 134,923 | 138,147 | 137,085 | 149,351 | 141,963 | 143,219 | 144,308 | 146,288 | 147,351 |
| Personal consumption expenditures..... | 121,690 | 133,972 | 134,726 | 136,349 | 122,863 | 129,158 | 135,243 | 131,747 | 133,479 | 134,649 | 135,762 | 136,272 | 137,484 | 138,363 |
| Durable goods..... | 105,184 | 106,037 | 105,185 | 107,354 | 107,658 | 108,520 | 109,275 | 111,117 | 113,013 | 113,550 | 113,643 | 111,990 | 113,407 | 113,774 |
| Nondurable goods..... | 119,045 | 121,693 | 123,224 | 124,088 | 128,579 | 127,812 | 128,806 | 130,758 | 131,055 | 132,012 | 133,780 | 135,056 | 136,912 | 137,912 |
| Services..... | 120,625 | 122,297 | 134,227 | 130,223 | 138,063 | 130,694 | 141,158 | 143,016 | 145,584 | 147,030 | 148,023 | 140,280 | 150,736 | 151,860 |
| Gross private domestic investment..... | 124,307 | 125,853 | 137,720 | 120,478 | 160,518 | 132,120 | 132,805 | 135,856 | 137,637 | 140,105 | 142,060 | 142,532 | 145,432 | 147,264 |
| Fixed investment..... | 121,444 | 122,043 | 134,684 | 120,317 | 127,780 | 130,742 | 131,480 | 134,423 | 135,122 | 138,471 | 140,513 | 141,157 | 143,801 | 145,392 |
| Nonresidential..... | 137,001 | 130,255 | 141,802 | 144,006 | 166,958 | 150,910 | 153,771 | 169,044 | 161,071 | 165,940 | 171,123 | 174,580 | 178,010 | 182,772 |
| Producers' durable equipment..... | 114,467 | 115,655 | 118,050 | 117,035 | 110,248 | 130,281 | 121,504 | 123,423 | 124,075 | 126,108 | 126,835 | 120,221 | 128,246 | 129,204 |
| Residential structures..... | 135,813 | 136,316 | 130,022 | 140,840 | 140,367 | 140,708 | 137,600 | 141,011 | 143,081 | 145,881 | 147,798 | 147,479 | 150,071 | 150,377 |
| Change in business inventories..... | | | | | | | | | | | | | | |
| Net exports of goods and services..... | 112,740 | 112,875 | 115,006 | 117,734 | 118,475 | 120,410 | 121,672 | 121,460 | 125,163 | 126,060 | 126,835 | 126,632 | 127,317 | 129,086 |
| Exports..... | 106,965 | 100,761 | 111,308 | 114,261 | 115,892 | 117,400 | 120,671 | 120,547 | 122,050 | 124,146 | 125,764 | 126,214 | 128,433 | 132,307 |
| Imports..... | | | | | | | | | | | | | | |
| Government purchases of goods and services..... | 140,645 | 142,339 | 145,987 | 146,965 | 153,118 | 154,652 | 157,637 | 159,743 | 164,182 | 165,766 | 168,389 | 170,657 | 174,446 | 177,591 |
| Federal..... | 131,459 | 132,855 | 137,596 | 139,186 | 145,982 | 146,237 | 147,016 | 149,201 | 155,776 | 156,584 | 158,347 | 161,208 | 167,533 | 170,106 |
| State and local..... | 161,079 | 165,686 | 156,809 | 158,179 | 151,478 | 154,835 | 159,541 | 171,040 | 174,340 | 178,035 | 179,804 | 181,445 | 184,774 | 185,026 |
| Addendum: Gross private product..... | 132,301 | 123,778 | 125,472 | 127,134 | 128,594 | 138,045 | 131,118 | 132,847 | 134,669 | 136,178 | 137,384 | 137,935 | 139,472 | 140,321 |